



## Brief report

## Suicidal ideation among patients with gender identity disorder

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## ABSTRACT

In this study, we tried to clarify the prevalence of suicidal ideation and self-mutilation including suicide attempts among patients with gender identity disorder (GID) and the relationship of those behaviors to demographic characteristics. A total of 500 consecutive Japanese GID patients without any other psychiatric comorbidity were evaluated at the outpatient GID Clinic of Okayama University Hospital. The lifetime rate of suicidal ideation was 72.0% of the total sample. There were no significant differences in the prevalence of suicidal ideation among groups divided by sex, age, age at onset or education. The lifetime prevalence of self-mutilation including suicide attempts was 31.8% of the total sample. Low level of education was significantly related to self-mutilation among both male-to-female and female-to-male GID patients. Younger age at onset was a significant factor affecting self-mutilation only among MTF GID patients. A lack of strategies to cope with severe distress among persons with lower education might induce a high frequency of self-mutilation including suicidal attempt. GID patients with a low level education might be at high risk of self-mutilation and should be watched with special attention to self-mutilation.

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## 1. Introduction

Gender identity disorder (GID) is characterized by a strong and persistent identification with the opposite sex and discomfort with one's own sex (American Psychiatric Association, 1994). Compared with many other psychiatric disorders, GID is rare, with an estimated worldwide lifetime prevalence of 0.001%–0.002% (Roberto, 1983) or 0.0019%–0.0024% (Landen et al., 1996a). The incidence of GID patients who requested sex reassignment therapy was reported to be 0.14/100,000/year in Sweden (Landen et al., 1996b). Thus, it has been difficult to establish demographic characteristics, and reports of large samples from countries outside of North America and Western Europe are extremely limited (Okabe et al., 2008; Matsumoto et al., 2009).

For most GID patients, a strong and persistent identification with the opposite sex and discomfort with one's own sex is a life challenge that often creates distress and carries potential stigmatization (Matsumoto et al., 2009; Hoshiai et al., 2010). Over half the GID patients experienced some form of harassment or violence within their lifetimes (Lombardi et al., 2001). Significantly more GID patients

reported suicide ideation and attempts than heterosexual males and females (Mathy, 2003; Clements-Nolle et al., 2006). Higher prevalence of suicidal ideation and suicide-related behaviors among GID patients might be due to societal oppression, stigmatization/discrimination and psychological mechanisms. However, there have been only a few studies on the prevalence of and risk factors for suicidal ideation and suicide-related behaviors among GID patients (Mathy, 2003; Clements-Nolle et al., 2006). The aim of the present study was to clarify the prevalence of and risk factors for suicidal ideation and self-mutilation including suicide attempt among GID patients in Japan.

## 2. Methods

## 2.1. GID clinic

The GID Clinic at Okayama University Hospital, the second oldest GID clinic in Japan, was established in Okayama in 1997. During the study period, the GID Clinic at Okayama University Hospital was the only special GID clinic in western Japan. It consists of four departments: psychiatry, urology, gynecology, and plastic and reconstructive surgery. The services at the GID Clinic include diagnosis, counseling, genetic testing, hormonal therapy, plastic surgery, and coordination of social services resources.

## 2.2. Ethics

This study was approved by the Internal Ethical Committee of Okayama University Graduate School of Medicine, Dentistry, and Pharmaceutical Sciences. After a complete description of the study to the subjects, written informed consent was obtained before their inclusion in the study.

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### 2.3. Subjects

A total of 603 consecutive Japanese patients consulted the outpatient GID Clinic of Okayama University Hospital between April 1, 1997, and October 31, 2005. All patients were comprehensively evaluated independently by at least two senior psychiatrists with a special interest in this area, and 579 of 603 patients fulfilled the criteria for GID according to the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV) (American Psychiatric Association, 1994).

Of 579 GID patients, current psychiatric comorbidity was assessed independently by two senior psychiatrists according to several clinical interviews and clinical records. Current psychiatric comorbidity (Axis I) was diagnosed in 79 patients, and 500 patients were without psychiatric comorbidity. The relationship of psychiatric comorbidity to suicidal ideation and self-mutilation among GID patients was reported previously (Hoshiai et al., 2010). To avoid the influence of current psychiatric comorbidity, only patients without psychiatric comorbidity were included in this study. All 500 patients were chromosomally and endocrinologically screened. Most patients were evaluated by psychological examinations including the stress coping inventory, the sentence completion test and the Baum test. The detailed results of the stress coping inventory were reported previously (Matsumoto et al., 2009). Statistical analyses on the results of other psychological tests have not been performed.

Of 500 patients, 311 (62.2%) were the female-to-male (FTM) type, and 189 (37.8%) were the male-to-female (MTF) type. The mean age at first examination was  $26.4 \pm 5.8$  years for the FTM type, and  $32.3 \pm 10.6$  years for the MTF type ( $P < 0.001$ ; independent sample *t*-test, *t* value = 8.078, degrees of freedom 498).

### 2.4. Suicidal ideation and self-mutilation

The lifetime presence or absence of serious suicidal ideation and self-mutilation was investigated by asking the following questions; "Have you ever seriously thought about committing suicide?" and "Have you ever mutilated yourself (including suicide attempt)?"

### 2.5. Statistics (data analysis)

Statistical analysis was conducted using SPSS 18.0 J (SPSS Inc., Chicago, IL, USA). The difference of the proportion of MTF and FTM GID patients among groups was evaluated using the  $\chi^2$  test. Comparison of suicidal ideation or self-mutilation for group differences was performed by the  $\chi^2$  test. The significance level was set at  $P < 0.05$ .

To identify which variables were significantly correlated with suicidal ideation or self-mutilation, we used multiple logistic regression. The multiple logistic regression analysis was performed using suicidal ideation or self-mutilation as a dependent variable. Independent variables were sex, age at first examination, age at onset (age when first thought about having the wrong sex), level of education, stage of therapy, steady partner and job. The final multiple logistic regression model was obtained after stepwise backward elimination of the independent variables using the likelihood-ratio test with  $P < 0.10$ . The strength of the relationship between independent variables and suicidal ideation or self-mutilation was expressed by means of an odds ratio (OR) with 95% confidence interval (CI) and *P*-value. Logistic regression analyses were conducted for MTF and FTM separately.

## 3. Results

### 3.1. Prevalence of suicidal ideation and self-mutilation (Table 1)

Demographic characteristics of the patients are shown at Table 1. The level of education was higher among MTF GID patients than among FTM GID patients. The presence of a steady partner was more frequent among FTM GID patients. Almost all variables differed between the MTF and FTM GID patients with the exception of suicidal ideation, self-mutilation and job.

Self-mutilation including suicide attempt was more frequent among GID patients with lifetime suicidal ideation; 43.3% among GID patients with lifetime suicidal ideation compared to 2.1% among GID patients without suicidal ideation. Almost all GID patients with a history of self-mutilation (97.9%) had experienced suicidal ideation.

### 3.2. Demographic characteristics of patients with suicidal ideation or self-mutilation

The prevalence rate of suicidal ideation was high in all age groups (Table 2). There were no significant differences in the prevalence rate of suicidal ideation among groups divided by age, age at onset, stage of therapy, level of education, steady partner or job (Table 2). Multiple logistic regression analysis revealed that younger age and higher stage

**Table 1**

Demographic characteristics of patients with gender identity disorder.

Variables	MTF	FTM	$\chi^2$	<i>P</i>
<i>n</i>	189	311		
Age (years): <i>n</i> (%)				
<24	50 (26)	133 (42)		
25–29	30 (16)	98 (32)		
30–34	40 (21)	47 (15)		
35–	69 (37)	33 (11)		
mean age	$32.3 \pm 10.6$	$26.4 \pm 5.8$		<0.001
Age at onset: <i>n</i> (%)				
Before elementary school	54 (29)	219 (70)	119.508	<0.001
Lower grades of elementary school	27 (14)	47 (15)		
Higher grades of elementary school	29 (15)	24 (8)		
Junior high school	40 (21)	16 (5)		
Senior high school and thereafter	39 (21)	5 (2)		
Stage of therapy at first examination: <i>n</i> (%)				
No therapy	83 (44)	185 (60)	11.789	0.003
Hormonal therapy without genital surgery	73 (39)	91 (29)		
With genital surgery	33 (17)	35 (11)		
Level of education: <i>n</i> (%)				
University or higher	71 (38)	66 (21)	15.977	<0.001
High school	97 (51)	206 (66)		
Junior high school	21 (11)	39 (13)		
Steady partner: <i>n</i> (%)				
Present	68 (36)	198 (64)	36.194	<0.001
Absent	121 (64)	113 (36)		
Job: <i>n</i> (%)				
Employed	126 (67)	228 (73)	2.511	0.113
Unemployed	63 (33)	83 (27)		
Suicidal ideation: <i>n</i> (%)				
Positive	141 (75)	219 (70)	1.021	0.312
Negative	48 (25)	92 (30)		
Self-mutilation: <i>n</i> (%)				
Positive	60 (32)	99 (32)	0.000	0.984
Negative	129 (68)	212 (68)		

MTF, male-to-female type; FTM, female-to-male type.

Age at onset, Age at first thought about having the wrong sex.

of therapy at first examination were significantly affecting suicidal ideation among MTF GID patients (Table 3). On the other hand, there were no significant factors affecting suicidal ideation among FTM GID patients (Table 3).

Not a few GID patients among all age groups experienced self-mutilation including suicide attempt (25.5%–35.6%) (Table 4). There were no significant differences in the prevalence rate of self-mutilation among groups divided by age, age at onset, stage of therapy, steady partner or job (Table 4). The rate of self-mutilation was higher among GID patients with lower levels of education (50.0% among GID patients who completed junior high school, 34.3% among GID patients who completed high school, and 18.2% among GID patients who completed university or higher (Table 4). Multiple logistic regression analysis revealed that low level of education was significantly affecting self-mutilation among both MTF and FTM GID patients (Table 5). Younger age at onset was significant factors affecting self-mutilation only among MTF GID patients (Table 5).

## 4. Discussion

### 4.1. Suicidal ideation

For more than 10 years, the number of suicides in Japan has been over 30,000 in a population of 120,000,000. In addition, the suicide rate among Japanese has been shown to be higher than in other developed countries (Yoshimasu et al., 2006). Recently, Ono et al. reported that the lifetime prevalence estimates of suicidal ideation was 10.9% in Japan (Ono et al., 2008). On the other hand, Matsumoto et al. reported that the lifetime history of suicidal ideation of 1726 junior and senior high school students was 40.4% (Matsumoto et al., 2008).

**Table 2**  
Comparison of GID patients with and without suicidal ideation.

Variables	Suicidal ideation		$\chi^2$	P
	+	-		
n	360	140		
Age (years): n (%)				
-24	134 (37)	49 (35)	2.602	0.457
25-29	94 (26)	34 (24)		
30-34	65 (18)	22 (16)		
35-	67 (19)	35 (25)		
Age at onset: n (%)				
Before elementary school	196 (55)	77 (56)	1.386	0.847
Lower grades of elementary school	57 (16)	17 (12)		
Higher grades of elementary school	37 (10)	16 (11)		
Junior high school	40 (11)	16 (11)		
Senior high school and thereafter	30 (8)	14 (10)		
Stage of therapy at first examination: n (%)				
No therapy	189 (52)	79 (56)	0.627	0.731
Hormonal therapy without genital surgery	121 (34)	43 (31)		
With genital surgery	50 (14)	18 (13)		
Level of education: n (%)				
University or higher	92 (26)	45 (32)	2.722	0.256
High school	226 (62)	77 (55)		
Junior high school	42 (12)	18 (13)		
Steady partner: n (%)				
Present	192 (53)	74 (53)	0.009	0.924
Absent	168 (47)	66 (47)		
Job: n (%)				
Employed	247 (69)	107 (76)	2.980	0.084
Unemployed	113 (31)	33 (24)		

Among 73 GID patients, the lifetime prevalence of suicidal ideation was reported to be 37.0% (Mathy, 2003). Suicidal ideators among GID patients were more likely than non-ideators to report difficulties with alcohol and drugs (Mathy, 2003). In another study, half of the 163 MTF GID patients with sex reassignment surgery (SRS) had contemplated suicide in their lives before SRS (Imbimbo et al., 2009). We here clarify the high incidence rate of suicidal ideation among both MTF and FTM GID patients (MTF, 74.6%; FTM, 70.4%). The frequency is very high among all age groups or all patients grouped by age at onset or level of education. In the present study, GID patients with current psychiatric comorbidity were excluded. Therefore, the high frequency of suicidal ideation among GID patients cannot be explained by psychiatric comorbidity. However, we did not evaluate sub-threshold psychiatric symptoms. Over half the GID patients (239/402, 59.5%) experienced some form of harassment or violence within their lifetime (Lombardi et al., 2001). Sub-threshold depression and anxiety

**Table 3**  
Multiple logistic regression analysis of factors affecting suicidal ideation.

	B	Standard error	P	Odds ratio	95% confidence interval of odds ratio	
					Lower	Upper
MTF						
Age	-0.038	0.016	0.020	0.963	0.932	0.994
Stage of therapy	0.579	0.263	0.027	1.785	1.067	2.986
Constant	1.358	0.604	0.025			
FTM						
Constant	0.867	0.124	0			

MTF, male to female type.

-2 log likelihood = 205.925; Model  $\chi^2 = 8.270$  ( $p = 0.016$ ).

Prediction equation:  $p = 1/[1 + \exp(-1 \times \text{Score})]$ .

Score =  $-0.038 \times \text{Age} + 0.579 \times \text{Stage of therapy} + 1.358$ .

FTM, female to male type.

Stage of therapy at first examination; No therapy = 1, Hormonal therapy = 2, With genital surgery = 3.

**Table 4**  
Comparison of GID patients with and without self-mutilation.

Variables	Self mutilation		$\chi^2$	P
	+	-		
n	159	341		
Age (years): n (%)				
-24	60 (39)	123 (37)	2.604	0.457
25-29	42 (26)	86 (25)		
30-34	31 (19)	56 (16)		
35-	26 (16)	76 (22)		
Age at onset: n (%)				
Before elementary school	90 (56)	183 (54)	6.594	0.159
Lower grades of elementary school	28 (18)	46 (13)		
Higher grades of elementary school	17 (11)	36 (11)		
Junior high school	17 (11)	39 (11)		
Senior high school and thereafter	7 (4)	37 (11)		
Stage of therapy at first examination: n (%)				
No therapy	79 (50)	189 (56)	2.061	0.357
Hormonal therapy without genital surgery	54 (34)	110 (32)		
With genital surgery	26 (16)	42 (12)		
Level of education: n (%)				
University or higher	25 (16)	112 (33)	21.655	<0.001
High school	104 (65)	199 (58)		
Junior high school	30 (19)	30 (9)		
Steady partner: n (%)				
Present	85 (53)	181 (53)	0.006	0.937
Absent	74 (47)	160 (47)		
Job: n (%)				
Employed	111 (70)	243 (71)	0.110	0.740
Unemployed	48 (30)	98 (29)		

might influence the high prevalence rate of suicidal ideation among GID patients.

Younger age and higher stage of therapy at first examination were associated with suicidal ideation among MTF GID patients in the present study. Younger age was reported to be significantly associated with the prevalence of suicidal attempt among GID patients (Clements-Nolle et al., 2006). GID patients at younger age may be vulnerable to gender-based harassment. MTF GID patients with hormonal therapy and/or genital surgery showed a higher prevalence of suicidal ideation in our study. More severe distress with suicidal ideation may induce a strong desire and real actions to receive a higher stage of therapy. However, we cannot clarify why younger age

**Table 5**  
Multiple logistic regression analysis of factors affecting self mutilation.

	B	Standard error	P	Odds ratio	95% confidence interval of odds ratio	
					Lower	Upper
MTF						
Level of Education	-0.966	0.268	0.000	0.381	0.225	0.643
Age at onset	-0.336	0.114	0.003	0.714	0.572	0.893
Constant	2.296	0.710	0.001			
FTM						
Level of Education	-0.677	0.223	0.002	0.508	0.328	0.786
Constant	0.625	0.464	0.179			

MTF, male to female type.

-2 log likelihood = 213.842; Model  $\chi^2 = 22.386$  ( $p < 0.001$ ).

Prediction equation:  $p = 1/[1 + \exp(-1 \times \text{Score})]$ .

Score =  $-0.966 \times \text{Level of education} - 0.336 \times \text{Age at onset} + 2.296$ .

FTM, female to male type.

-2 log likelihood = 379.407; Model  $\chi^2 = 9.718$  ( $p = 0.002$ ).

Prediction equation:  $p = 1/[1 + \exp(-1 \times \text{Score})]$ .

Score =  $-0.677 \times \text{Level of education} + 0.625$ .

Level of education; Junior high school = 1, High school = 2, University of higher = 3.

Age at onset; Before elementary school = 1, Lower grades of elementary school = 2.

Higher grades of elementary school = 3, Junior high school = 4, Senior high school and thereafter = 5.

and higher stage of therapy were related to prevalence of suicidal ideation, only among MTF GID patients.

#### 4.2. Self-mutilation

The prevalence of suicidal attempt among 515 GID patients was reported to be 32% (MTF, 32%; FTM, 32%) (Clements-Nolle et al., 2006). Younger age (<25 years), depression, substance abuse treatment, forced sex, gender-based discrimination, and gender-based victimization were independently associated with suicidal attempt (Clements-Nolle et al., 2006). In another study, the lifetime prevalence of suicidal attempt was reported to be 23.3% among 73 GID patients (Mathy, 2003). Attempters were more likely than non-attempters to report psychiatric medications as well as difficulties with alcohol and/or drugs (Mathy, 2003). The prevalence of suicidal ideation and suicidal attempt among GID patients was reported to decrease dramatically after SRS (Imbimbo et al., 2009).

In this study, the prevalence rate of self-mutilation including suicide attempt was high among both MTF and FTM GID patients (31.7% in MTF, and 31.8% in FTM GID patients), and similar to that in the study by Clements-Nolle et al. However, in this study, the presence or absence of forced sex, gender-based discrimination and gender-based victimization was not estimated. GID patients with psychiatric comorbidity were not included. Therefore, most of the risk factors reported in their study could not be assessed.

The prevalence rate of self-mutilation was higher among GID patients with less education. Multiple logistic regression analysis revealed that low level of education was a significant factor affecting self-mutilation. The intimate relationship of low level education to suicidal attempt was reported (Ozdel et al., 2009; Tang et al., 2009). The majority of suicide attempters were characterized by low educational status (Ozdel et al., 2009), and dropout from school was associated with suicidal attempt (Tang et al., 2009). A lack of strategies to cope with severe distress among persons with lower education might induce a high frequency of self-mutilation including suicidal attempt (Ozdel et al., 2009; Tang et al., 2009). In GID patients with a low education level, special attention should be paid to the possibility of self-mutilation.

Besides low level of education, younger age at onset was independently associated with self-mutilation among MTF GID patients. Severe distress in childhood might influence the prevalence of self-mutilation (Tang et al., 2009). However, we cannot clarify why younger age at onset was related to prevalence of suicidal ideation, only among MTF GID patients.

#### 4.3. Limitation of this study

Several limitations of this study have to be considered. Firstly, it is a clinic-based study rather than a field study. Therefore, the sample is large, but not necessarily representative of all GID individuals. As stated above, in this study, 60.3% were FTM GID patients, and 39.7% were the MTF type. This proportion is not common in studies on GID. Secondly, the data were based on retrospective self-reporting of the occurrence and timing of suicide-related outcomes and mental disorders, and thus may be subject to underreporting and biased recall. We could not collect information from third-party informants to validate the respondents' reports. Thirdly, we were unable to clarify the frequency of self-mutilation. Therefore, for example, GID patients

reporting self-mutilation include both those with only one instance of self-mutilation and frequent self cutters. Fourth, psychiatric comorbidity was diagnosed according to DSM-IV, but the structured interview for DSM-IV was not used. Regarding the results of Hepp et al. (2005) who found a comorbidity rate of 39% (12/31) using the structured clinical interview, a comorbidity rate of 14% (79/579) in this study was low. The possibility that clinical diagnosis without a structured interview missed psychiatric comorbidity cannot be denied. Further investigation is needed to clarify in more detail the relationship of suicidal ideation and self-mutilation to various risk factors.

Despite these limitations, this is the first report to clarify the prevalence of and risk factors for suicidal ideation and self-mutilation including suicide attempt among GID patients outside of North America and Western Europe.

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